



NM\_001768 & M27161  
Homo sapiens (Human)  
Complete CD8 alpha mRNA

**Predicted polypeptide sequence**

MALPVTALLLPLALLLHAARPSQFRVSPLDRTWNLGETVELKCQ  
VLLSNPTSGCSWLFQPRGAAASPTFLLYLSQNKPKAAEGLDTQRFSGKRLGDTFVLT  
SDFRRENEGYYFCSALSNSIMYFSHFVPVFLPAKPTTTPAPRPPTPAPTIASQPLSLR  
PEACRPAAGGAVHTRGLDFACDIYWAPLAGTCGVLLLSLVITLYCNHRNRRRVCKCP  
RPVVKSGDKPSLSARYV

**mRNA**

1 gaaatcaggc tcggggccgg ccgaagggcg caacttccc cctcggcgc cccacggct  
61 cccgcgcgc tccctcgcg ccgagcttc gagccaagca gctcctggg gagcgcgtca  
121 tggccttacc agtgaccgcc ttgctctgc cgctggcctt gctgctcac gccgccaggc  
181 cgagccagtt ccgggtgtcg ccgctggatc ggacctggaa cctgggcgag acagtggagc  
241 tgaagtgcc ggtgtgtctg tccaaccga cgtcgggctg ctgtggctc ttccagccgc  
301 ggggcgcgc cgcagctcc acctctctc tataccttc caaaaacaag cccaagggg  
361 ccgaggggct ggacaccag cggtctcgg gcaagaggtt gggggacacc ttgtctca  
421 cctgagoga ctccgcga gagaacgagg gctactatt ctgctggcc ctgagcaact  
481 ccatcatgta ctccagccac ttgtgcccg tctcctgcc agcgaagccc accacgagc  
541 cagcgcgcg accaccaaca ccggcgccca ccctcgcgc gcagccctg tccctgcgc  
601 cagagggctg ccggccagcg gcggggggcg cagtgcacac gagggggctg gacttcgct  
661 gtgatatca catctgggcg ccttggcgc ggactgtgg ggtccttc ctgtactgg  
721 ttatcaccct ttactgcaac cacaggaacc gaagacgtgt ttgcaaatgt ccccggcctg  
781 tggtaaaac gggagacaag ccagcctt cggcgagata cgtctaacc tgtcaacag  
841 ccactacatt actcaaaact gagatcctc ctttgaggg agcaagtcct tcccttcat  
901 ttttccagt ctctccct gtgtattcat tctcatgatt attatttag tgggggcgg  
961 gtgggaaaga ttacttttc ttatgtgt tgacgggaaa caaaactagg taaaatctac

**FIG.\_1A-1**

1021 agtacaccac aaggggcaca atactgttgt ggcacatcg cggtagggcg tggaaagggg  
1081 caggccagag ctaccgcag agttctcaga atcatgctga gagagctgga ggcacccatg  
1141 ccatctcaac ctctccccg ccggttttac aaagggggag gctaaagccc agagacagct  
1201 tgatcaaagg cacacagcaa gtcaggggtg gagcagtagc tggagggacc ttgtctccca  
1261 gtcaggggt ctctctcca caccattcag gtcttcttt ccgaggcccc tgtctcaggg  
1321 tgagggtgct gagtctcaa cggcaaggga acaagtactt ctgatacct gggatactgt  
1381 gccagagcc tcgaggaggt aatgaattaa agaagagaac tgccttggc agagtctat  
1441 aatgtaaaca atatcagact tttttttt ataalcaagc ctaaaattgt atagacctaa  
1501 aataaaatga agtggtgagc ttaacctgg aaaatgaatc cctctatctc taaagaaaat  
1561 ctctgtgaaa cccctatgtg gaggcggaat tgctctccca gcccttgcac tgcagagggg  
1621 ccatgaaaag aggacaggct acccctttac aaatagaatt tgagcaccag tgagggtaaa  
1681 ctaaggccct ctgaaatctc tgaatttgag atacaaacat gttcctggga tcaactgatga  
1741 cttttatc tttgtaaaga caattgttg agagccccct acacagccct ggcctctgct  
1801 caactagcag atacagggat gaggcagacc tgactctctt aaggaggctg agagcccaaa  
1861 ctgctgtccc aaacatgcac ttcttgctt aaggtatgtt acaagcaatg cctgcccatt  
1921 ggagagaaaa aacttaagta gataaggaaa taagaaccac tcataattct tcacctagg  
1981 aataatctcc tgtaatatg ggtacattc ttctgatta tttctacac atacatgtaa  
2041 aatatgtctt tctttttta ataggggtgt actatgctgt tatgagtggc ttaatatgaat  
2101 aaacatttgt agcatctct ttaatgggta aacagcaaaa aaaaaaaaaa aaaaaaaaaa  
2161 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa  
2221 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa a

**FIG. 1A-2**

NM\_171827

Homo sapiens secreted protein derived from alternate transcript

**Predicted polypeptide**

MALPVTALLPLALLHAARPSQFRVSPLDRTWNLGETVELKCQVLLSNPTSG  
CSWLFQPRGAAASPTFLLYLSQNKPKAAEGLDQRFSGKRLGDTFVLTLSDFR  
RENEGYYFCSALSNSIMYFSHFVPVFLPAKPTTTPAPRPPTPAPTASQPLSLR  
PEACRPAAGGAGNRRRVCKCPRPVVKSGDKPSLSARYV

**mRNA**

1 gaaatcaggc tccgggccgg ccgaaggcg caactttccc cctcggcgc cccacggct  
61 cccgcgcgc tccctcgcg ccgagctc gagccaagca ggcctctgg gagcgcgtca  
121 tggccttacc agtgaccgc ttgctctgc cgctggcctt gctgctcac gccgccaggc  
181 cgagccagtt ccgggtgtcg ccgctggatc ggacctgga cctgggcgag acagtggagc  
241 tgaagtcca ggtgctgtg tccaaccga cgtcgggctg ctgtggctc ttccagccgc  
301 ggggcgcgc gccagtcac accttctcc tataccttc caaaacaag cccaaggcg  
361 ccgaggggct ggacaccag cggctctcg gcaagaggtt gggggacacc ttgctctca  
421 cctgagcga cttccgcga gagaacgagg gctactatt ctgctcgcc ctgagcaact  
481 ccatcatgta cttcagcac ttgtgcgg tcttctgcc agcgaagccc accacgacgc  
541 cagcgccgcg accaccaaca ccggcgcca ccatcgctc gcagccctg tccctgcgc  
601 cagagggctg ccggccagc gcgggggcg cagggaaccg aagacgtgt tgcaaatgtc  
661 cccggcctgt ggtcaaatcg ggagacaag ccagccttc ggcgagata gtctaaccct  
721 gtgcaacagc cactacatta cttcaactg agatcctcc tttagggga gcaagtcct  
781 cccttcatt ttctcagtc ttctcctg tgtattcatt ccatgatta ttatttagt  
841 gggggcgggg tgggaaagat tacttttct ttatgtgtt gacgggaaac aaaactaggt  
901 aaaatctaca gtacaccaca agggtcaca tactgtgtg cgcacatgc ggtagggcgt  
961 ggaaaggggc aggccagagc taccgcaga gtctcagaa tcatgctgag agagctggag

**FIG. 1B-1**

1021 gcacccatgc catctcaacc tcttccccgc ccgttttaca aagggggagg cttaaagcca  
1081 gagacagctt gatcaaaggc acacagcaag tcagggttgg agcagtagct ggagggacct  
1141 tgtctcccag ctccagggtc ttctctccac accattcagg tcttcttctc cgaggccct  
1201 gtctcagggt gaggtgcttg agtctccaac ggcaagggaa caagtacttc ttgatacctg  
1261 ggatactgtg cccagagcct cgaggaggta atgaattaaa gaagagaact gcctttggca  
1321 gagttctata atgtaaacaa tatcagactt ttttttta taalcaagcc taaaattgta  
1381 tagacctaaa ataaaaatgaa gtggtgagct taaccttga aatgaatcc ctctatctct  
1441 aaagaaaatc tctgtgaaac ccctatgtg aggcggaatt gctctcccag cccctgcatt  
1501 gcagagggggc ccatgaaaga ggacaggcta cccctttaca aatagaattt gagcatcagt  
1561 gaggttaaac taaggccctc ttgaatctct gaatttgaga tacaacatg ttctgggat  
1621 cactgatgac ttttatact ttgtaaagac aattgttga gagccctca cacagccctg  
1681 gcctctgctc aactagcaga tacagggatg aggcagacct gactcttta aggaggctga  
1741 gagcccaaac tgctgtocca aacatgcact tcttgctta aggtatgga caagcaatgc  
1801 ctgcccattg gagagaaaaa acttaagtag ataaggaaat aagaaccact cataattctt  
1861 caccttagga ataactctct gttaatatgg tgtacattct tctgattat ttctacaca  
1921 tacaigtaaa atatgtcttt ctttttaaa taggggtgta ctatgctgtt atgagtggct  
1981 ttaatgaata aacatttgta gcatcctctt taatgggtaa acagcaaaaa aaaaaaaaaa  
2041 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa  
2101 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa

**FIG.\_1B-2**

X60223  
Pongo pygmaeus (Orangutan)  
Complete CD8 alpha mRNA

**Predicted polypeptide**

MALPVTALLPLALLHAARPSQFRVSPLDRTWNLGETVELKCQ  
VLLSNPTSGCSWLFQPRGAAASPTFLLYLSQNKPKAAEGLDTQRFSGKRLGDTFVLT  
SDFRRENEGYYFCSALSNSIMYFSHFVPVFLPVHTRGLDFACDIYIWAPLAGTCGVLL  
LSLVITLYCNHRNRRRVCKCPRPVWKS GGKPSLSERYV

**mRNA**

1 atggccttac ccgtgaccgc ctgtctctg ccgctggcct tgtgtctcca cgccgccagg  
61 ccgagccagt tccgggtgtc gccgctggat cggacctgga acctgggcga gacgggtggag  
121 ctgaagtgcc aggtgtgtct gtccaaccgc acgtctggct gctcctggct cttccagccg  
181 cgtggcgccg ccgccagtcc cacctctctc ctatacctct cccaaaacaa gcccaaggcg  
241 gcgagggggc tggacacca gccgttctcg ggcaagaggt tgggggacac cttcgtctc  
301 acctgagcg acttcgccg ggagaacgaa ggctactatt tctgtcggc cctgagcaac  
361 tcatcatgt acttcagcca cttcgtgcg gtcttctgc cagtgcacac gagggggctg  
421 gacttcgct gtgatatcta catctgggcg ccctggccg ggacctgtg ggtccttctc  
481 ctgtcactgg ttatcacct ttactgcaac cacaggaacc gaagacgtgt ttgcaaatgt  
541 ccccggcctg tggtaaatac tggaggcaag ccagccttt cggagagata tgtctaa

***FIG. 1C***

XM\_132621 & BC030679 & U34881  
 Mus musculus (Mouse)  
 Complete CD8 alpha mRNA

**Predicted polypeptide**

MASPLTRFLSLNLLLLGESIILGSGEAKPQAPELRIFPKKMDAE  
 LGQKVDLVCEVLGVSQGC SWLFQNSSSKLPQPTFVVMAS SHNKITWDEKLNSSKLF  
 SAMRDTNNKYVLT LNKFSKENEGYYFC SVISNSVMYFSSV PVLQKVNSTTTK PVLRT  
 PSPVHPTGTSQPQRPEDCRPRGSVKGTGLDFACDIYI WAPLAGICVALLLSLIITLIC  
 YHRSRKRVCCKPSIACLCLKLQGS KWYESVICSALAVSIRC NKSKSGELPLAVHLDIR  
 APCKNWEIAGSLVERYGKSGKHSPLSLKAVVESN

**mRNA**

1 atggcctcac cggtgacccg cttctgtcg ctgaacctgc tgcctctggg tgagtcgatt  
 61 atcctgggga gtggagaagc taagccacag gcaccogaac tcgaatctt tcaaagaaa  
 121 atggacgccg aacttggtca gaagggtggac ctggtatgtg aagtgtggg gtccgttctg  
 181 caaggatgct cttggctctt ccagaactcc agctccaaac tccccagcc caccttcgtt  
 241 gtctatatgg ctcatccca caacaagata acgtgggacg agaagctgaa ttctcgaaa  
 301 ctgtttctg ccatgaggga cacgaataat aagtacgttc tcacctgaa caagttcagc  
 361 aaggaaaacg aaggctacta ttctgtctca gtcatcagca actcggatg gtacttcagt  
 421 tctgtctgc cagtccttca gaaagtgaac tctactacta ccaagccagt gctgcgaact  
 481 cctcacctg tgcacctac cgggacatct cagccccaga gaccagaaga ttgtcggccc  
 541 cgtggctcag tgaaggggac cggatggac ttgcctgtg atatttcat ctgggcaccc  
 601 ttggccggaa tctgcgtggc cttctgtg tcttgatca tcaactcat ctgctaccac  
 661 aggagccgaa agcgtgtttg caaatgtccc agtatagcat gcttgtcct caaactgcaa  
 721 ggaagcaagt ggtatgaatc tgtgatctgc tcagctctgg ctgtgagcat cagatgtaac  
 781 aatcaaaagt caggagaact gcccttagcg gtgcacctgg acatcagagc cccttgtaag  
 841 aactgggaaa ttgctggcag tctagtggag cggtagcgta aatctggaaa acactccct  
 901 ctgtcactga aggctgtagt agaatccaat taa

***FIG.\_1D-1***

**Predicted polypeptide**

MDAELGQKVDLVCEVLGSVSQGCSWLFQNSSSKLPQPTFVVYMA  
 SSHNKITWDEKLNSSKLF SAMRDTN NKYVLT LNKF SKENEGYYFC SVISNSVMYFSSV  
 VPVLQKVNSTTTKPVL RTPSPVHPTGTSQPQRPEDCRPRGSVKGTGLDFACDIYWAP  
 LAGICVALLLSLIITLIC YHRSRKRVC KPRPLVRQEGKPRPSEKIV

**mRNA**

1 cgttgacccg cttctgtcg ctgaacctgc tgcctgtggg tgcgtcgatt atcctgggga  
 61 gtggagaagc taagccacag gcacccgaac tccgaatctt tccaaagaaa atggacgccg  
 121 aacttggtca gaaggtggac ctggtatgtg aagtgttggg gtccgtttcg caaggatgct  
 181 cttggtctt ccagaactcc agctccaaac tccccagcc caccttcgtt gtctatatgg  
 241 cttcatccca caacaagata acgtgggacg agaagctgaa ttctgcgaaa ctgttttctg  
 301 ccatgaggga cacgaataat aagtacgttc tcacctgaa caagttcagc aaggaaaacg  
 361 aaggctacta ttctgtctca gtcatcagca actcgggtgat gtacttcagt tctgtcgtgc  
 421 cagtccttca gaaagtgaac tctactacta ccaagccagt gctgcgaact cctcacctg  
 481 tgcacctac cgggacatct cagccccaga gaccagaaga ttgtcggccc cgtggctcag  
 541 tgaaggggac cggattggac ttgcctgtg atatttcat ctgggcaccc ttggccggaa  
 601 tctgcgtggc ccttctgtg tcttgatca tctctcat ctgctaccac aggagccgaa  
 661 agcgtgtttg caaatgtccc aggccgctag tcagacagga aggcaagccc agaccttcag  
 721 agaaaattgt gtaaatggc accgccagga agctacaact actacatgac ttcagatctc  
 781 ttctgcaag aggccaggcc ctcttttctc aagtttctg ctgtcttatg tattgccctc  
 841 tgtattgtt tagtaggggt gtgatgggga cagttcctt ttctttatga attctcttg  
 901 acacaaagca tactgtatg catacaatgg gagtaatgag cagactgtaa caccagagct  
 961 agttccagtt tcggggtcca tgcgctggt ggccctcagca ccacttgat ataaatctcc  
 1021 tgtctgcca tcatatagaa gaagctgaag atcagagggtg gaaacagcag gatctgtaga  
 1081 cccggagaga acccaagcta gaggaacct cactgactgg tgcagggatc tcaccccat  
 1141 cccctgagct ctctgttag gtatgtgtct ttagtatagc atgcttgtgc ctcaaactgc  
 1201 aaggaagcaa gtggtatgaa tctgtgatct gtcagctct ggctgtgagc atcagatgta  
 1261 acaaatcaaa gtcaggagaa ctgcctttag cgggtcacct ggacatcaga gcccttgta  
 1321 agaactggga aattgctggc agtctagtgg agcggtagcg taaatctgga aaacactccc  
 1381 ctctgtcact gaaggctgta glagaatcca attaaagcta ttcaaaccac aaaaaaaaaa  
 1441 aaaaaaaaaa aa

**FIG. 1D-2**

**Predicted polypeptide**

MASPLTRFLSLNLLLMGESIILGSGEAKPQAPELRIFPKMDAE  
LGQKVDLVCEVLGVSVSQGCSWLFQNSSSKLPQPTFVVYMASSHNKITWDEKLNSSKLF  
SAVRDTNNKYVLTlnKFskENEGYYFCsvISNSVMYfSSVVPVLQKVNSTTTKpVLRt  
PSPVHPTGTSQPQRPEDCRPRGSVKGTGLDFACDIYIWAPLAGICVAPLLSLITLIC  
YHRSRKRVCkCPRPLVRQEGKPRPSEKIV

**mRNA**

1 atggcctcac cgttgacccg cttctgtcg ctgaacctgc tgctgatggg tgagtcgatt  
61 atcctgggga gtggagaagc taagccacag gcaccogaac tccgaatctt tccaaagaaa  
121 atggacgccg aactggcca gaaggtggac ctggtatgtg aagtgtggg gtccgttcg  
181 caaggatgct ctggctctt ccagaactcc agctocaaac tccccagcc caccttogg  
241 gtctatatgg ctcatocca caacaagata acgtgggacg agaagctgaa ttgtcgaaa  
301 ctgtttctg ccgtgaggga cacgaataat aagtacgttc tcacctgaa caagttcagc  
361 aaggaaaacg aaggctacta ttctgtctca gtcacagca actcggatgat gtacttcagt  
421 tctgtctgc cagtcctca gaaagtgaac tctactacta ccaagccagt gctgcgaact  
481 cctcacctg tgcaccctac cgggacatct cagccccaga gaccagaaga ttgtcgcccc  
541 cgtggctcag tgaaggggac cggattggac ttgcctgtg atatftacat ctgggcaccc  
601 ttggccggaa tctgcgtggc cctctgtctg tcttgatca tcacttcat ctgtaccac  
661 aggagccgaa agcgtgttg caaatgtccc aggccgctag tcagacagga aggcaagccc  
721 agacctcag agaaaattgt gtaa

***FIG.\_1D-3***



NM\_031538  
Rattus norvegicus (Rat)  
Complete CD8 alpha mRNA

**Predicted polypeptide**

MASRVICFLSLNLLLDVITRLQVSGQLQLSPKKVDAEIGQEVK  
LTCEVLRDTSQGCSWLFRNSSSELLQPTFIIYVSSSRSKLNDILDPNLF SARKENNKY  
ILTLSKFSTKNQGYFCSITSNSVMYFSPLVPVFQKVNSIITKPVTRAPTPVPPPTGT  
PRPLRPEACRPGASGSVEGMGLGFACDIYWAPLAGICAVLLLSLVITLICCHRNRRR  
VCKCPRPLVKPRPSEKFV

**mRNA**

1 ccctagagcc ctgcttgac ctaaggtgct ggtgggacgc acaccatggc ctcacgggtg  
61 atctgcttc tgcgctgaa cctgctactg ctggatgta tcactaggct ccaggtttcc  
121 ggacagttac agttgtcacc aaagaaagtg gacgctgaaa ttggccagga ggtgaagcta  
181 acatgcgaag tgctgcggga cacttcgcaa ggaatgcttt ggctcttcg gaactccagc  
241 tcgaactcc tcagccac cttcatcatc tatgtatct catcccgag caagctgaac  
301 gatatactgg atccgaatct gttctctgcc cggaaggaaa acaacaata catctcacc  
361 ctgagcaagt tcagcactaa aaaccaaggc tactattct gctcaatcac cagcaactcg  
421 gtgatgtact tcagtcctct ggtgccggtg ttccagaaag tgaactctat tatcaccaag  
481 ccggtgacgc gagctccac accagtgcct cctctacag ggacaccccg gccctacga  
541 ccagaagctt gccgacccgg ggcgagtggc tcagtggagg gaalgggatt gggcttcgcc  
601 tgcgatattt acatctgggc accctggcc ggaatctgcg cggttctct gctgtccctg  
661 gtcacacac tcactctgtg ccacaggaac cgaaggcgtg ttgcaaag tcccaggccc  
721 ctgtcaagc ccagacctc agagaaatc gtgtaaaatg gcgccactag gaagccacaa  
781 ctactacatg acttcagaga ttctcacia gagaccgggc cctcctttt cagagtttc  
841 tgctggctta tataatgtcc tctgtattgt tttaggggta ggaaggggac agttccttt  
901 tcttatgaa ttctcttga tacaaaacat actgtatgc acacaatggg gtaaagatca  
961 gactgtaaca ccagagatag tccagtttc agggtcagcg tagctggtg

**FIG. 1E**

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AY303773  
 Cavia porcellus (Guinea Pig)  
 Complete CD8 alpha mRNA  
Predicted polypeptide

MAPRGSAWLLLLPVALLLDAATAQGASQFRMSPRELVAQVGTKV  
 TLRCEVLVPNAPAGCSWLFQPRHDAKGPTFLLYHSASGTKLAPGLEQKRFSPSKSSNT  
 YTLTVNSFQKRDEGYFCSVSGNMMLYFSPFVPVFLPAPRTTTPPPPTTPTPSVQPT  
 SVRPETCVVSKGAAGARWLDLSCDVYIWAPLASTCAALLLALVITIICHRNRNRQRVCK  
 CPRPQARSGGKPSPSGKLV

mRNA

1 gcaactccc cactgcgcac cccctggctc ctggtggctc ctgggcggct cccctcacgc  
 61 ctggactcca ggctctgccc tgcgcggagg agcgcgcgcc atggccccgc gaggaagcgc  
 121 ctggctgctg ctgctgccgg tggccctgct gctcgacgcc gccacggccc aaggtgccag  
 181 tcagttccga atgtaccccc gtgaactggt cgcgcaagtc ggcaccaaag tgacctgctg  
 241 ctgtgagggt ctggtgccta acgcgcgggc gggatgctcg tggctcttcc agccccgcca  
 301 cgacgccaaa ggtcccacct tctctctgta ccattcggcg tccgggacca agttggcccc  
 361 agggctggaa cagaagcgat tcagccctc gaagagcagt aacacctaca ccttcacggt  
 421 gaacagcttc cagaagcgag acgaaggcta ctactctgc tgggtctccg gcaacatgat  
 481 gctctacttc agcccgctcg tccccgtct cctgccagct cctgcacca cgacgcccc  
 541 tccccctccc accacgcca cccacagcgt gcagcccacg tgggtgcgcc ccgagacgtg  
 601 tgtggtctct aaggggcgag cagggtgcgag gtggctggat ctctctgtg atgtctacat  
 661 ctgggcgccc ctggccagca catgcgcggc cctctgctg gcactggtca tcacgatcat  
 721 ctgccaccgc aggaacagac aacgcgtttg caaatgtct agggcccaag ccaggctctg  
 781 aggcacaacc agccctcag ggaagttagt ctaacaacat ggcgcccagc ctgtgcgaag  
 841 ccactacatg actttatact gagatcattc ctggacagc aagtgtctct ctttgggtt  
 901 tccagctct ccttctatg tattgttct cattactatt ttagtgggca tggggtggga  
 961 agagttgctt ttctgttaga caaaaaataa aaccatgtag catctgcagc tcacaagggt  
 1021 cacagggtct ttacctaca caggggttag gtagcaagc agggctctca ggtactggaa  
 1081 ttactccct tccactact tgagggtggg cagcaccac gggtcattta tccctcatca  
 1141 tgctctcca ccaactgag ctcatatgcc acccaaagag cagtctatct aaaccaggc  
 1201 caaacacatg caactgctt ttgaaccga gagcctaatt tatctgcaga gaatgcaagt  
 1261 gctccttgt cactatac ttgtcatga ccttaataa atgtgctgct ttccctcaa  
 1321 aaaaaaaaaa

**FIG. 1F**

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NM\_174015  
 Bos taurus (Cow)  
 Complete CD8 alpha mRNA

**Predicted polypeptide**

MASLLTALILPLALLLLDAAKVLGSLSFMSPTQKETRLGEKVE  
 LQCELLQSGMATGCSWLRHIPGDDPRPTFLMYLSAQRVKLAEGLDPRHISGAKVSGTK  
 FQLTLSSFLQEDQGYFCSVVSNSILYFSNFVPVFLPAKPATTPAMRPSSAAPTSAPO  
 TRSVSPRSEVCRTSAGSAVDTSRLDFACNIYIWAPLVGTGCVLLLSLVITGICYRRNR  
 RRVCKCPRPVVRQGGKPNLSEKYV

**mRNA**

1 gaattcggat ccaccatggc ctactcttg accgccctga tctgcogct ggccctgctg  
 61 ctgctgatg cgcgaaggt cctcggtgct ctctgttcc ggatgtgccc gacgcagaag  
 121 gagaccagac tgggcgagaa ggtggagctg caatgcgagt tgctgcagtc cggcatggcg  
 181 acagggtgct cctggctccg ccacataccc ggggacgacc ccagaccac ctctaatg  
 241 tacctctccg cccaacgggt caagctagcc gagggactgg acccagaca catttcggc  
 301 gccagggtct cggcaccaa attccagctc accctgagca gcttctcca ggaggaccaa  
 361 ggctactatt ttgctcggg cgtgagcaac tcgatactgt acttcagtaa ctctgtcct  
 421 gtcttctgc cagcgaagcc ggccaccacg ccggcgatgc ggccatccag cgcggcgccc  
 481 accagcgcgc cgcagactag gtcggtctct ccgcgatcag aggtgtgccg gacctggcg  
 541 ggcagcgcag tggacacgag ccggctggac ttgcctgca atatctacat ctgggctccc  
 601 ttggtcggga cctgcggcgt ccttctctg tcattgtca tcacaggcat ctgctaccg  
 661 cggaaccgaa gacgtgtctg caaatgtccc aggcctgtgg tccgacaagg aggcaagccc  
 721 aaccttcag agaaatatgt ctaacatggc gatgggcccc gtgtgacagc cactacaaga  
 781 ctgcactg agaactctcc tgagatcctt ccttttgat ttccctgc ttcttctt  
 841 ctgttatta ttattttca tgggggtggg gtgggaagag ttacttttc ttattatt  
 901 acttgatac aaaacaagac actcgtgtct aaggcatacc acaagggtta tcatgctgt  
 961 gtgctcccat actcgggtag agggcgggcg ggccagagct accgcaagct ctattctag

**FIG.\_1G-1**

1021 aacctggctg tgagaactgg tgggggcctc ggcacccact cagccccaac ttctcctcca  
1081 cccattttac aaaagaggac gctgaggccc agagatgggg aacagctgga tcagagtccc  
1141 agcagggctc cacacaactg agatctttct tctggaggcc tctgtctcag cgtggggagc  
1201 tggatctcaa gcctcagaga actagtatt tctgaagcat ctgtgataga cccatgactg  
1261 caccagagc ctgatgagg taatgaaata ggacaagaaa actgacaga gttctgtgat  
1321 actgctgaac aggatcagat tttttttt ataataaagc atgaaatgat acagataata  
1381 ggaattcttc caatgaagtg gaaggagtga actgaatgat ggaaaatgag caacctgacc  
1441 tctgaagaaa atctctggga aatccagacc tggagatggt tctccagacc ctgtattgc  
1501 agaaggaccc tcaaagagga gaggccaccc tctgcaagca tgatttgagc gttaggaaag  
1561 ttgaatggag ttcaagtctc tctaaacatt gagattccgt attcaaacaat gctcctgggt  
1621 tatcgggtgag tttttatagt ttgtaaaggg agaattgtga ccgagcagct ggcacaggcc  
1681 ctggcacccc aggctagcag ctgagggaat gtgcagacac tggtaggag gctacgagcc  
1741 cagctgcagc cctacaaggc atttccctcc ttactgtgtt ctgcaaaaaa tgcattgctca  
1801 ctgggagaaa aaatgtagct aaggtagtaa gaatcatccg taattcttta cctcagggat  
1861 aatccattgt taatattatg ggctacattc ttctgatta tttctgtgc cctacatata  
1921 aaatatataa ttttataaaa tgggattgca ctatgctttt ataaatggct ttaataaaca  
1981 aacatttatg gcttacttct t

**FIG.\_1G-2**

AY517855  
 Sus scrofa (Domestic pig)  
 Complete CD8 alpha mRNA

**Predicted polypeptide**

VELQCELMHSNTLTSCSWLYQKPGAASKPIFLMYLSKTRNKTAE  
 GLDTRYISGYKANDNFYLILHRFREEDQGYFCSFLSNSVLYFSNFMSVFLPAKPTKT  
 PTTPPPKRTPTKASHAVSVAPEVCRPSGNADPRKLDLACDLYNWAPLVGTSGILLLSL  
 VITIICHRNRNRRRVCKCPRPVVRQGGKASPSERFI

**mRNA**

1 gtggagctgc agtgcgagtt gatgcactcc aacacactga caagctgttc ctggctctac  
 61 cagaagccgg gggctgcctc caagcccatc ttctcatgt acctctcaa aaccgggaat  
 121 aagacagccg aggggctgga caccggttac atctctgggt acaaggccaa tgacaacttc  
 181 taacctatcc tgcaccgctt ccgcgaggag gaccaaggct actatttctg ctggttctctg  
 241 agcaactcgg tttgtattt cagcaacttc atgtccgtct tcttgccagc aaagcccacc  
 301 aagacgccga ctacgccacc acccaagcgg actcccacca aagcgtcgca cgcggtgtct  
 361 gtggccccag aggtgtgccg gccttcgggc aacgcagacc cgaggaagct ggacctcgcc  
 421 tgtgatctgt acaactgggc gcccttggtt gggacctccg gcatccttct cctgtcactg  
 481 gtcacacca tcactcgcca ccgccggaac agaagacgtg ttgcaaatg tcccaggccc  
 541 gtggtcagac agggaggcaa ggccagccct tcagagagat tcactaaca tggcgacatg  
 601 cccacgcag cagccactac aagacctcaa actgagacct ctccgggcag gagagcaagg  
 661 gtcccttctt ttccgtttcc ccagccttcc ttcttctt aagtattctt ctattatta  
 721 ttatttccat gggggtgggg tgggaagggt gacttttct ttgggtgtt actttaattg  
 781 acacaaaacg agactctatc acgtcttgg tacgccgcag gggttcgaac accgttgtgc  
 841 tcacacacac aacggtgaag ggtgggcggg ccagagctac cgcaagctgt gttctcagaa  
 901 ccaggctgtg agagctggtg gggggtgggg aggccctcgg caccacaca ggccaaacct  
 961 ctccccctgc ccccatctt acaaaggaat gaggctgagg ccagagatg gggggtggct

***FIG.\_ 1H-1***

1021 ggatcagagc cccagcaagg ctccaggctc atcctccaca gcatttgggc ctctctcca  
1081 ggggccctcg tctcagctgg gggagctg tctccacct caaggaaaca aggtttgctt  
1141 gggcacctgt gatagactct gcactgtgcc cagagccccg gggaggcaat gcagtaagtc  
1201 aaggggacgt gacagaggtc tacggtgcag ttgaacagga tcagatatat ttttttaat  
1261 aatccagcat gaagttatat agataacagg aattcctcaa atagagtga agggctgaac  
1321 tgaatcctgg aaagtgaaca acacgacctc taaaggaaat ccaatgcaaa aaatctctaa  
1381 gtggagacac agtggctctc ccaggggacc catgaaagag gggaagccgc cctttgcaaa  
1441 tatgattga gcatcgcgaa agtcgaacgg aggtcggccc tctctaaatg tgagatctga  
1501 tattigaacg tgctcctcgg atcattgatg ggttttttg gtttgtaaac acagaattat  
1561 gaccgagtag ctggcctccc ctggaccagc agctgtggat atggggcaga ctctgatgag  
1621 gaggctagga gccagactg ctgccctcta cgcgcatttc ctctcttaac catgttgtac  
1681 aagaaatgcg tgctcgctgg aagaaaaaac taaataataa gagtcacca taattcttta  
1741 ctctggtat aactcattgt taatattatg gtgtacattc ttctgatta tttctatgc  
1801 acgtatataa aatgtatact ttttaaaaat ggaattgtac tatgcttta gaagtggttt  
1861 taataaacat ttctgctatg aaaaaaaaaa a

**FIG.\_1H-2**

D16536  
Felis catus (cat)  
Complete CD8 alpha mRNA  
Predicted polypeptide

MASPVTAQLLPLALLLHAAAAAGPSPFRLSPVRVEGRLGQRVEL  
QCEVLLSSAAPGCTWLFQKNEPAARPIFLAYLSRSRTKLAELDPKQISGQRIQDTLY  
SLTLHRFRKEEEGYFCSVVSNSVLYFSAFVPVFLPVKPTTTPAPRPPTQAPITTSQR  
VSLRPGTCQPSAGSTVEASGLDLSCDIYWAPLAGTCAFLLLSLVITVICNHRNRRRV  
CKCPRPVWRAGGKPSPSERYV

mRNA

1 atggcctctc cggtgactgc ccagctcctg ccgctggcct tgctgctca tgccgccgca  
61 gccgccgggc cgagcccgtt ccgcttatcg cccgtgaggg tggagggcag gctcggccag  
121 cgggtggagc tgcagtgcga ggtgctgctg tcacagcgcg cgccgggctg cacctggctc  
181 ttccagaaga acgaacctgc cggccgcccc atcttcttgg cgtacctctc cagaagccgg  
241 accaagtgg ccgaggagct ggaccccaaa cagatctcgg gccagaggat tcaggacacc  
301 ctctacagtc tcacctgca cagattccgc aaggaggaag aaggctacta ttctgctcg  
361 gtgtgagca actccgttct gtacttcagc gccttcgtcc cggttcttct gccagtcaag  
421 cccaccacta cgcccgcgcc ggcaccgccc acgcaggcgc ccatcaccac gtgcagcgg  
481 gtgtctctgc gcccggggac ctgccagcct tcagcgggca gcacagtgga agcaagtggg  
541 ctggatttgt cctgtgacat ctacatctgg gcacccctgg ctgggacctg cgcttctt  
601 ctctgtgcg tggatcacat cgtcatctgc aaccacagga accgaagacg tgtttgcaaa  
661 tgtccgaggc ccgtggtcag agcaggaggc aagcctagcc cgtcagagag atacgtctaa  
721 catggagatg ggcccatgc accagccact acaagaccaa ataaaactct ctttatgagg  
781 acagt

**FIG. 11**

AY065643

Sigmodon hispidus (Hispid cotton rat)

Complete CD8 alpha mRNA

**Predicted polypeptide**

MAPRVTRFLCLTLLEFJAELGGSKDFEMSPKKVVAHLGKEVRL

TCEVWVSTSQGCSWLFLEHGSGVKPTFLIYLSGSRNERNNKIPSTKLSGKKEDKKYTL

TLNNFAKEDEGYFCSVTSNSVVFSPPLSVFLPEKPTTPVPKPPTSVPPTAISRLR

PEACRPGAGTSVEKKGWDFDCDIILAPLAGLCGVLLLSLVTTLICCHRNKRKRVCKCP

RPVVRQGGKPSPSGKLV

**mRNA**

1 ctctgcttg acctaagctg ctggtggaag cactgccatg gccccccggg tgacccgctt  
 61 tctgigcctg accctgctgc tggaaattat cgctgagctc ggaggctoga aagatttoga  
 121 aatgtctcct aagaagggtg tcgccacact tggcaaggag gtgaggctaa catgccaagt  
 181 gtgggtgtct acttcgaag gatgctcttg gctcttctg gagcatggct ccggagttaa  
 241 acccacttfc ctcatctatc tctctgggag ccgcaacgaa cggaataaca aaataccttc  
 301 aactaagcta tctgggaaga aggaagacaa aaagtacacc ctacccctga ataatttgc  
 361 taaggaagac gaaggctact attctgcctc tgcacaagc aactcgggtg tgtacttcag  
 421 tctctctgtg tcgggtcttc tgccagagaa acctaccaca ccagtgcga aaccacccac  
 481 atcagtgcgc actacggcga tatctcggc cctgcgacca gaagctgcc gacctggagc  
 541 cggcacctca gtggagaaga agggatggga ctgcactgt gatatcatca ttctggcacc  
 601 cttagctgga ctctgtgggg tctctctgct gtctctggc accacactca tctgctgcca  
 661 caggaacaga aaacgagctc gcaaatgtcc caggcccgtg gtcagacaag gaggcaagcc  
 721 cagcccttca gggaaactcg tgaagatgg cgccaagaaa ctacaactac tacttcagag  
 781 acctctcat ctagagctcc agctctcctt ctcaatttt tctcaccttc ctatatattg  
 841 ttcttctat tatcttagtg ggggtaggac aggggtggaa ccatttctt tctttatgaa  
 901 ttcacttga cacaaaacaa gaccacataa tgcacacggg ataccataag ggcaggagct  
 961 gttgctgcgt acatagcatg tgggggaagt acagaacagc tgtctgggtt ctgaggatca  
 1021 gtggatgac agcaccact tgatgatcta aatgcctgt ctgccatta tatagaagag  
 1081 gtgaaggtc agaaatgggg tgggcaggat ctgtgcacca ggagagaacc caagctgacg  
 1141 aaatcctcac tggatggctc aggaacttg cctctatac ctgagttctc ttatttcagg  
 1201 cctgtgcctg gtagtgtga ggctgagta

**FIG.\_1J**



AJ130818  
Saimiri sciureus (Common Squirrel Monkey)  
Complete CD8 alpha mRNA

**Predicted polypeptide**

MASPV TALL LPLALL HAARPSRFRVSPLDRTWNLGDKVELKCE  
VLLSNPSSGCSWLFQKRGAAASPTFLLYISQTKPKVADGLDAQRFSGKKMGDSFILTL  
RDFREEDQGFYFCSALSNSIMYFSPFVPVFLPAKPTTTPAPRPPTPEPTTASQPLSLR  
PQACRPPAGGAVDTRGLDFACDIYWVPLAGTCGVLLLSLVITVYCNHRNRRRVCKCP  
RPAVKSGGKPSPSERYV

**mRNA**

1 atggcctctc cctgaccgc cttgctcctg ccgctggccc tgctgtcca cgctgccagg  
61 ccgagccggg tccgggtgtc gccgctggat cggacctgga actggggcga caaggtggag  
121 ctgaagtgcg aggtgctgct gtccaacccg tctcggggct gctcgtggct cttccagaag  
181 cggggcgctg ccgccagccc cacttctctc ctgtacatct cccaaaccaa goccaagggtg  
241 gccgatgggc tggacgcca gcgctctcc ggcaagaaga tgggggacag cttcattctc  
301 accctgcgcg acttcgcgga ggaggaccag ggcttctatt tctgctcggc cctgagcaac  
361 tccatcatgt acttcagccc ctctgtgccg gtcttctgc cagcgaagcc caccacgacg  
421 ccagcgccgc gaccacccac accggagccc accaccggt cgcagcccct gtccctgcgt  
481 ccacaggctt gccggccccc gccggggggc gcagtggaca cgagggggct ggacttcgcc  
541 tgtatatct acatctgggt gccctggcc gggacctgcg gggctctct cctgtcactg  
601 gtcatcacgc ttattgcaa tcacaggaa cgcgcacgtg ttgcaaatg tccccggcct  
661 gcgggtcaagt ctggaggcaa gccagccct tcggagagat acgtctaa

**FIG.\_1K**

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Domains of the CD8  $\alpha$ -ChainsLeaderTransmembrane**Human CD8  $\alpha$ -Chain**

Protein:

<b>MALPVTALLL</b>	<b>PLALLLHAAR</b>	<b>PSGFRVSPLD</b>	<b>RTWNLGETVE</b>	<b>LKCGVLLSNP</b>
TSGCSWLFGP	RGAAASPTFL	LYLSGNKPKA	AEGLDTGRFS	GKRLGDTFVL
TLSDFRRENE	GYFCSALSN	SIMYFSHFVP	VFLPAKPTTT	PAPRPPTPAP
TIASGPLSLR	PEACRPAAGG	AVHTRGLDFA	<u>CDIYIWAPLA</u>	<u>GTCGVLLLSL</u>
<u>VITLYCNHRN</u>	RRRVCKCPRP	VKSGDKPSL	SARYV	

mRNA - coding

<b>atggccttac</b>	<b>cagtgaccgc</b>	<b>cttgctcctg</b>	<b>ccgctggcct</b>	<b>tgctgctcca</b>
<b>cgccgccagg</b>	<b>ccgagccagt</b>	tccgggtgtc	gccgctggat	cggacctgga
acctgggcca	gacagtggag	ctgaagtgcc	aggtgctgct	gtccaacccg
acgtcgggct	gctcgtggct	cttcagccg	cgcggcgccg	ccgccagtec
caccttcctc	ctatacctct	cccaaaacaa	gccaaggcg	gccgaggggc
tggacaccca	gcggttctcg	ggcaagaggt	tgggggacac	cttcgtcctc
accctgagcg	acttccgccg	agagaacgag	ggctactatt	tctgctcggc
cctgagcaac	tccatcatgt	acttcagcca	cttcgtgccg	gtcttcctgc
cagcgaagcc	caccacgacg	ccagcgccgc	gaccaccaac	accggcgccc
accatcgcgt	cgcagcccct	gtccctgcgc	ccagaggcgt	gccggcccagc
ggcggggggc	gcagtgcaca	cgagggggct	ggacttcgcc	tgtgatatact
<u>acatctgggc</u>	<u>gcccttggcc</u>	<u>gggacttgctg</u>	<u>gggtccttct</u>	<u>cctgtcactg</u>
<u>gttatcacc</u>	<u>tttactgcaa</u>	<u>ccacaggaac</u>	<u>cgaagacgtg</u>	<u>tttgcaaatg</u>
tccccggcct	gtggtcaa	cgaggagaaa	gcccagcctt	tcggcgagat
acgtctaa				

**FIG.\_2A**

**mouse CD8  $\alpha$ -Chain**

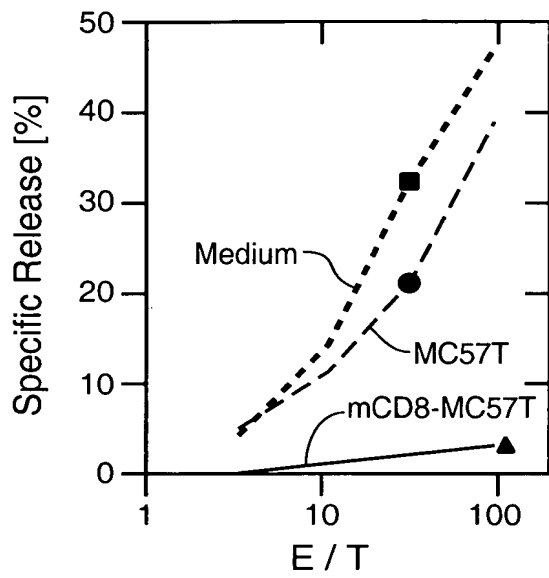
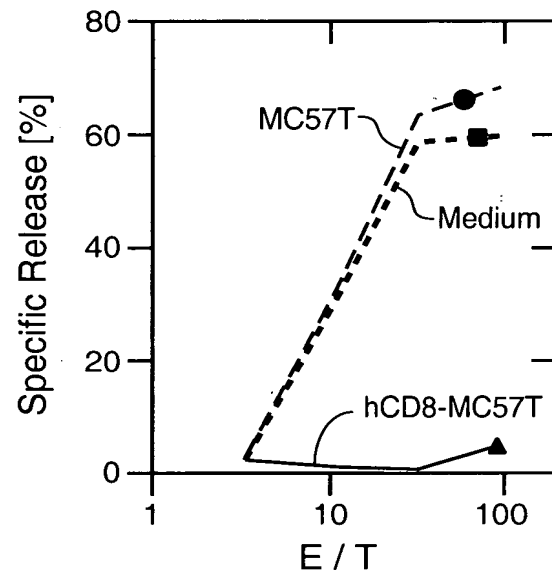
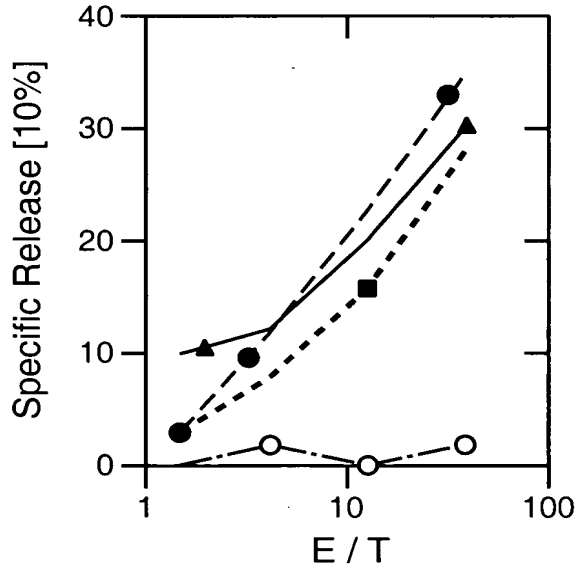
Protein:

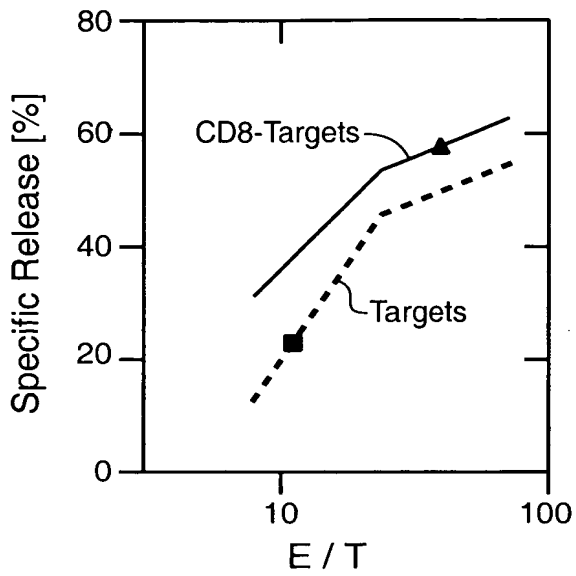
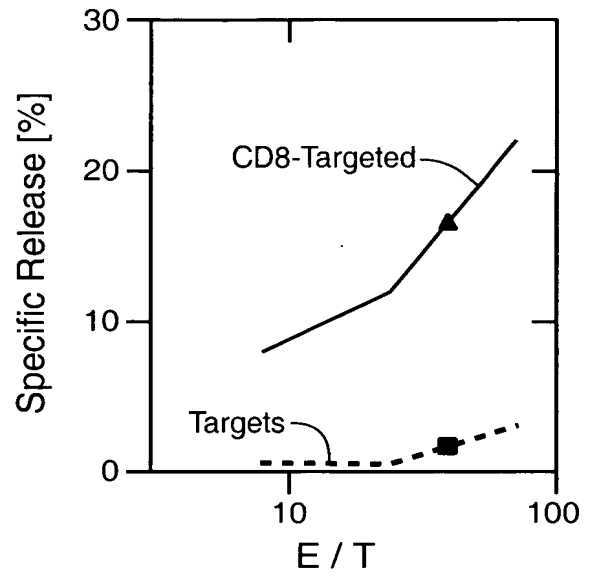
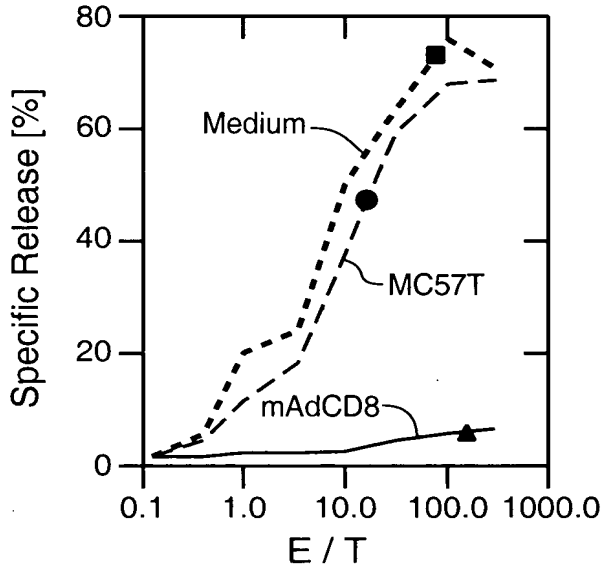
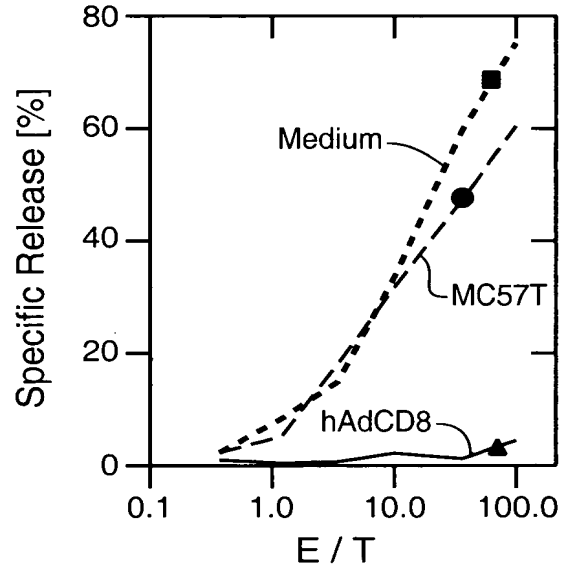
<b>MASPLTRFLS</b>	<b>LNLLLLGESI</b>	<b>ILGSGEAKPG</b>	APELRIFPKK	MDAELGGKVD
LVCEVLGSVS	GGCSWLFGNS	SSKLPGPTFV	VYMASSHNKI	TWDEKLNSSK
LFSAMRDTNN	KYVLTLNKFS	KENEGYYFCS	VISNSVMYFS	SVVPVLGKVN
STTTKPVLRT	PSPVHPTGTS	GPGRPEDCRP	RGSVKGTGLD	FACDIYIWAP
<u>LAGICVALLL</u>	<u>SLIITLICYH</u>	RSRKRVCCKP	SIACLCLKLG	GSKWYESVIC
SALAVSIRCN	KSKSGELPLA	VHLDIRAPCK	NWEIAGSLVE	RYGKSGKHSP
LSLKAVVESN				

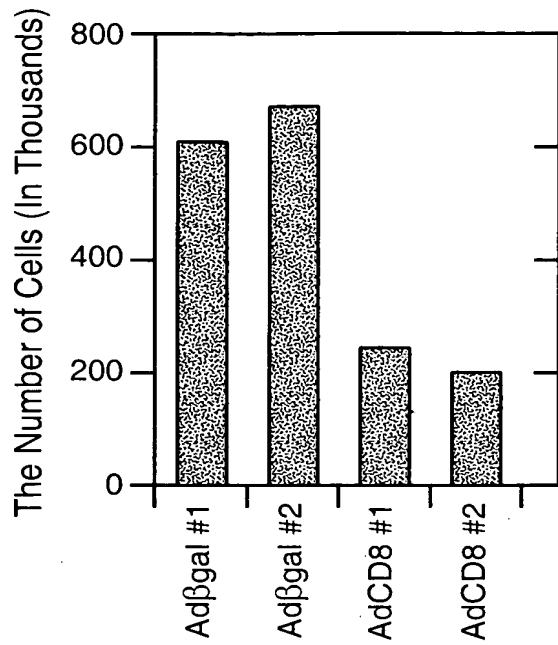
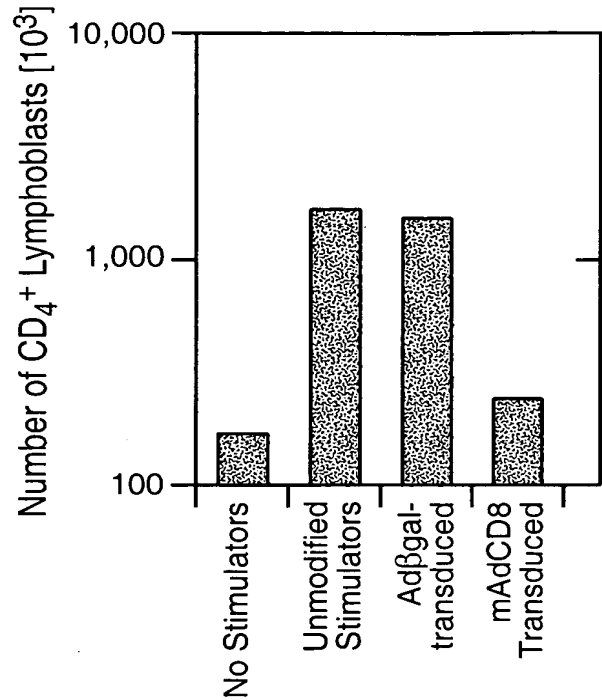
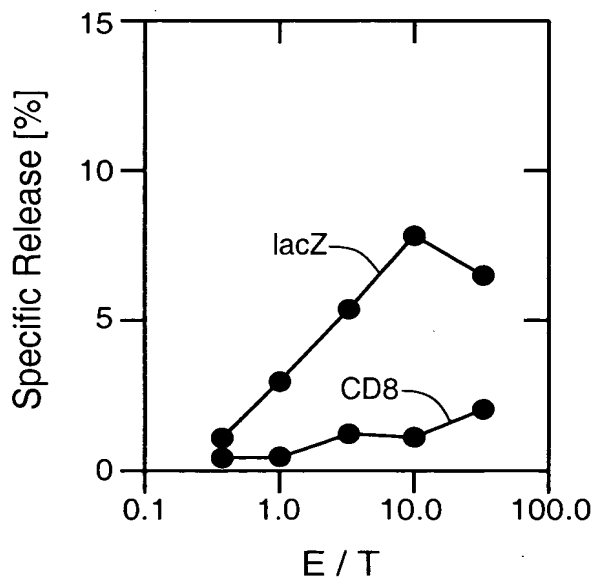
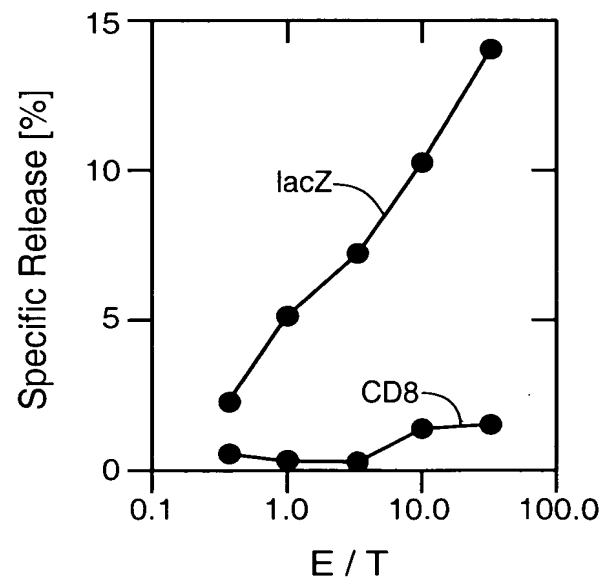
mRNA Coding

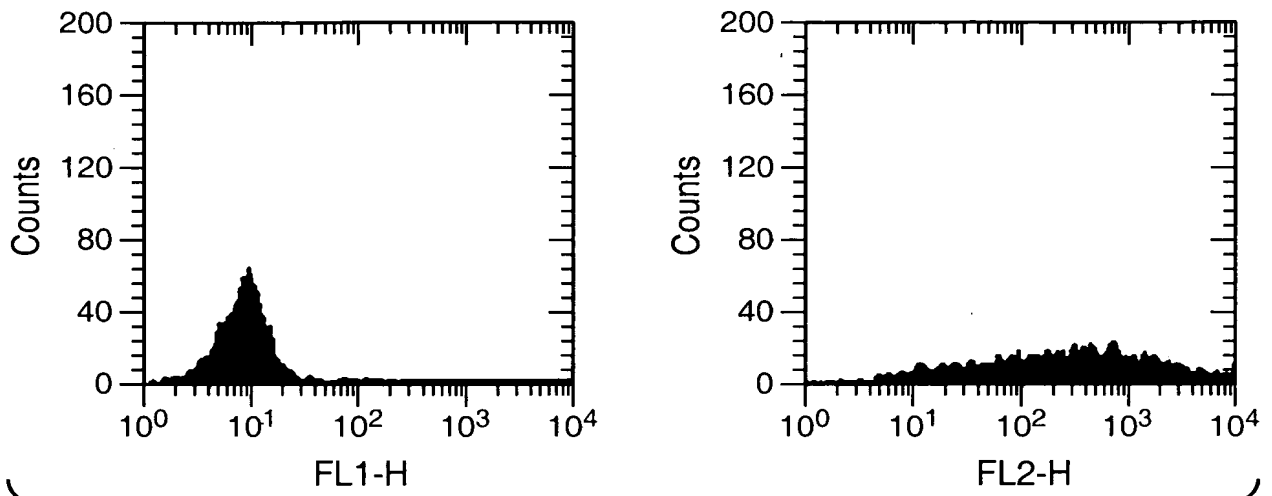
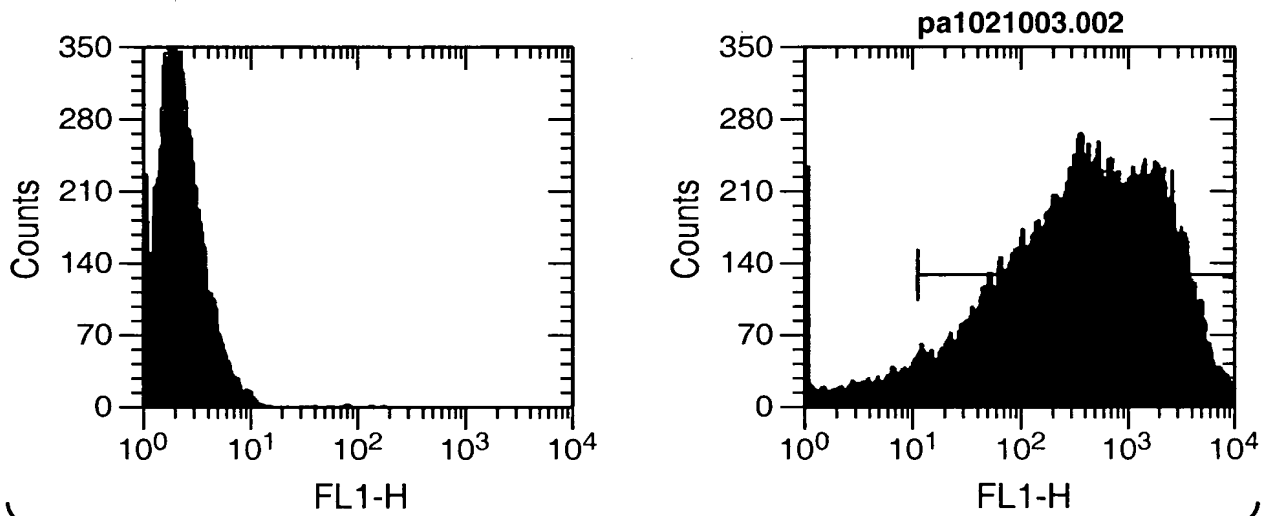
<b>atggcctcac</b>	<b>cgttgacccg</b>	<b>ctttctgtcg</b>	<b>ctgaacctgc</b>	<b>tgctgctggg</b>
<b>tgagtcgatt</b>	<b>atcctgggga</b>	<b>gtggagaagc</b>	<b>taagccacag</b>	<b>gcacccgaac</b>
tccgaatctt	tccaaagaaa	atggacgccg	aacttggtca	gaaggtggac
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ctgttttctg	ccatgaggga	cacgaataat	aagtacgttc	tcaccctgaa
caagttcagc	aaggaaaacg	aaggctacta	tttctgctca	gtcatcagca
actcggtgat	gtacttcagt	tctgtcgtgc	cagtccttca	gaaagtgaac
tctactacta	ccaagccagt	gctgcgaact	ccctcacctg	tgcaccctac
cgggacatct	cagccccaga	gaccagaaga	ttgtcggccc	cgtggctcag
tgaaggggac	cggattggac	ttcgcctgtg	atatttacat	<u>ctgggcaccc</u>
<u>ttggccggaa</u>	<u>tctgcgtggc</u>	<u>ccttctgctg</u>	<u>tccttgatca</u>	<u>tcactctcat</u>
<u>ctgctaccac</u>	<u>aggagccgaa</u>	agcgtgtttg	caaagtgtcc	agtatagcat
gcttgtgcct	caaactgcaa	ggaagcaagt	ggtatgaatc	tgtgatctgc
tcagctctgg	ctgtgagcat	cagatgtaac	aaatcaaagt	caggagaact
gccttttagcg	gtgcacctgg	acatcagagc	cccttgtaag	aactgggaaa
ttgctggcag	tctagtggag	cggtacggta	aatctggaaa	acactccct
ctgtcactga	aggctgtagt	agaatccaat	taa	

**FIG.\_2B**

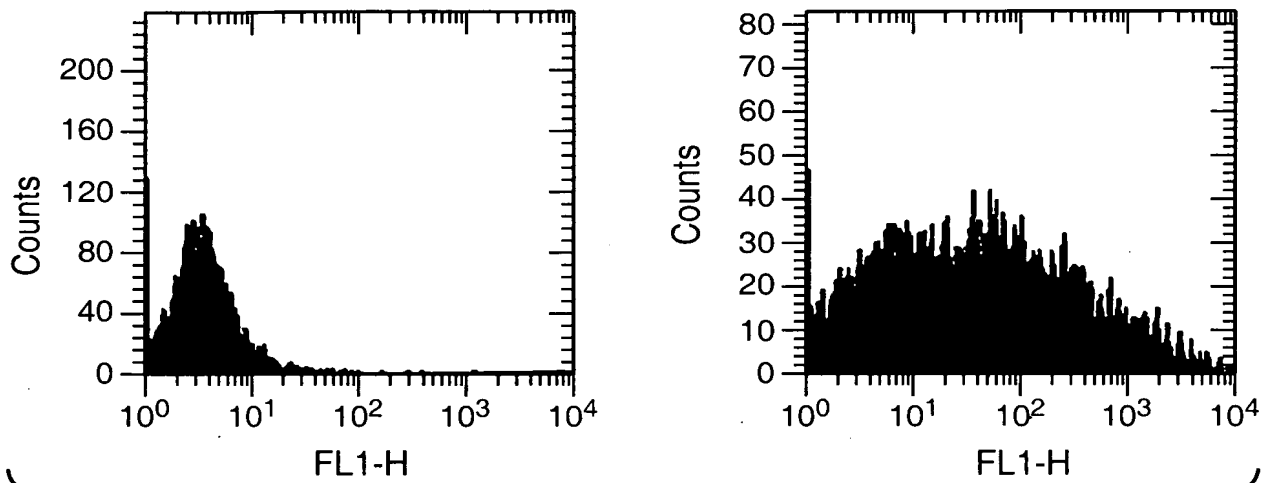
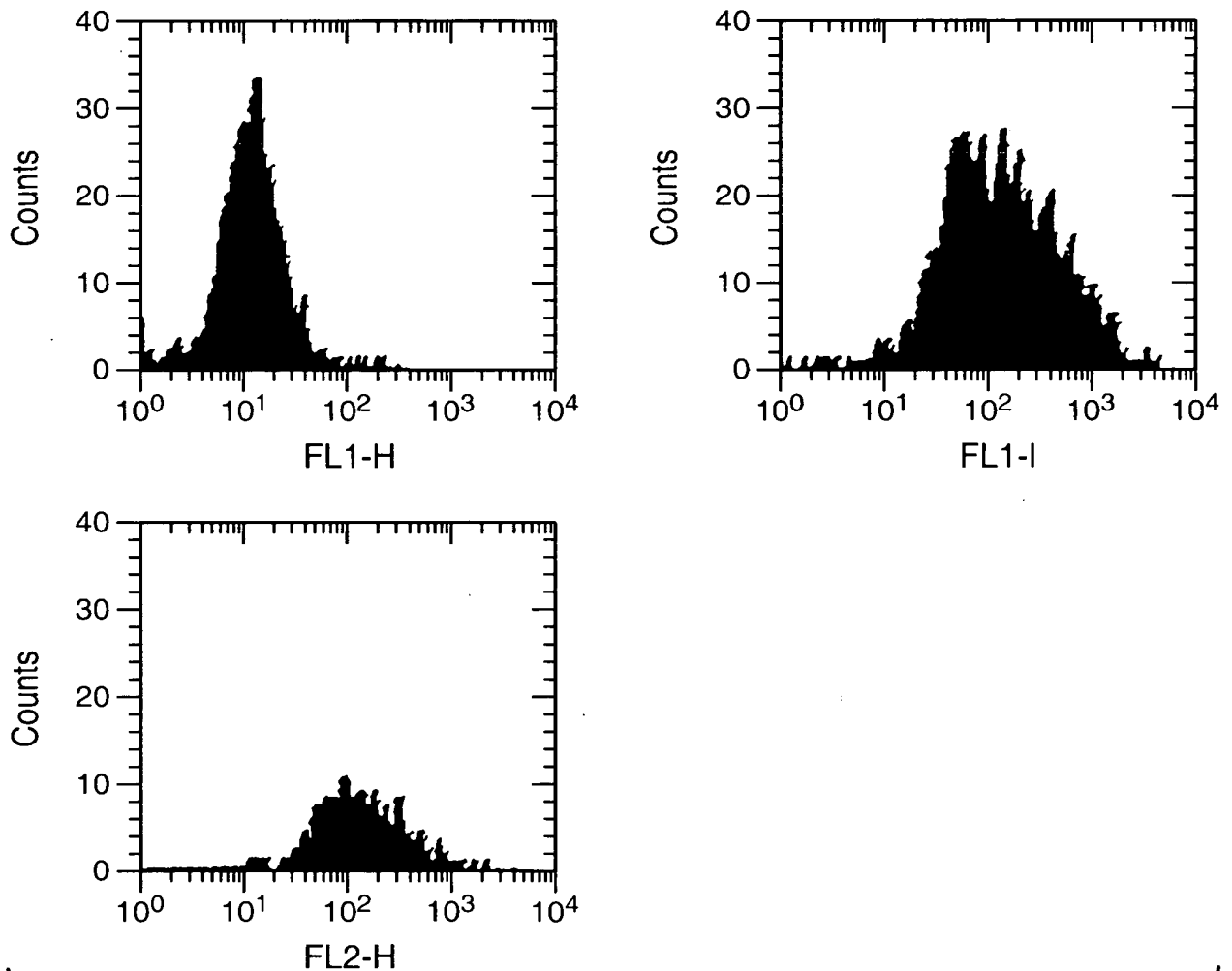
**FIG.\_3A****FIG.\_3B****FIG.\_4**

**FIG.\_5A****FIG.\_5B****FIG.\_6A****FIG.\_6B**

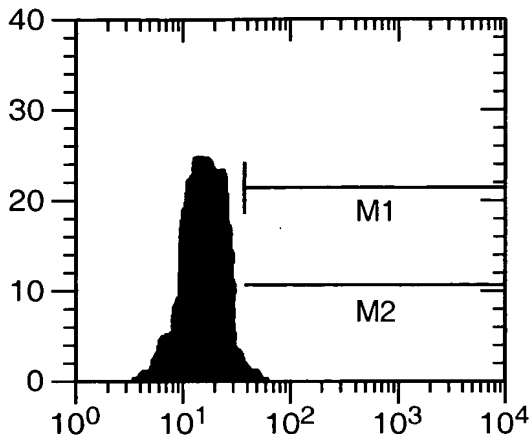
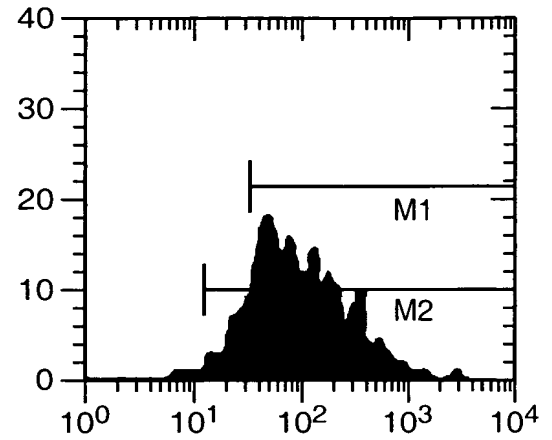
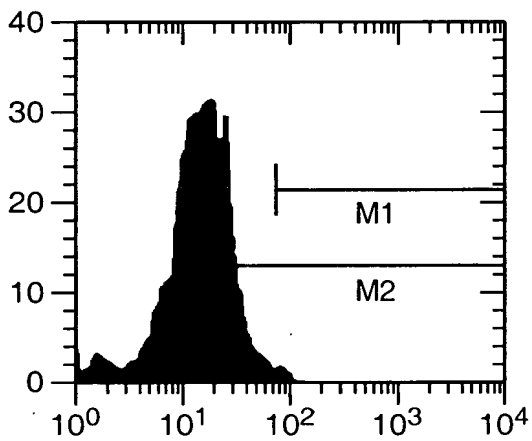
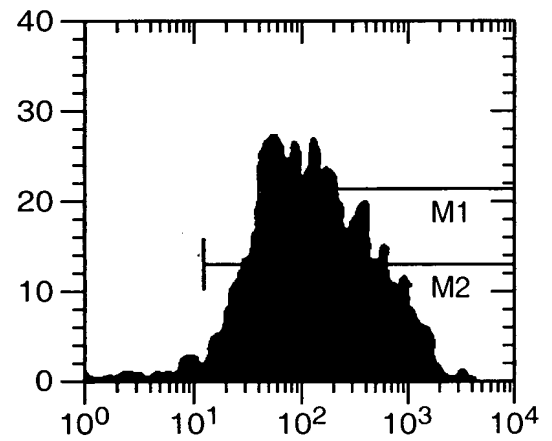
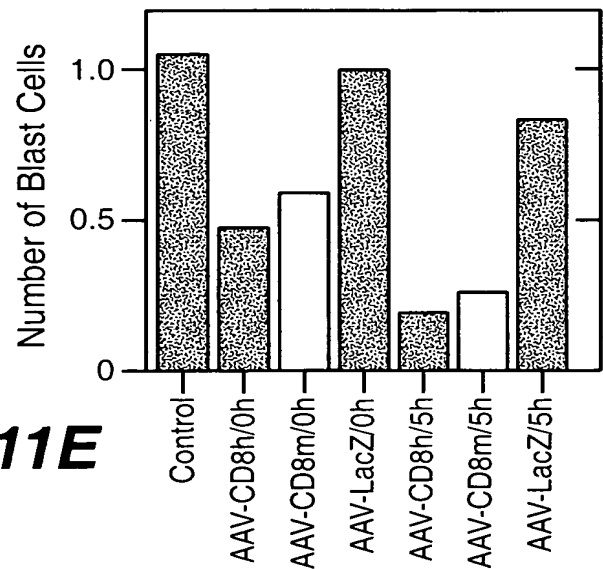
**FIG. 7****FIG. 9****FIG. 8A****FIG. 8B**

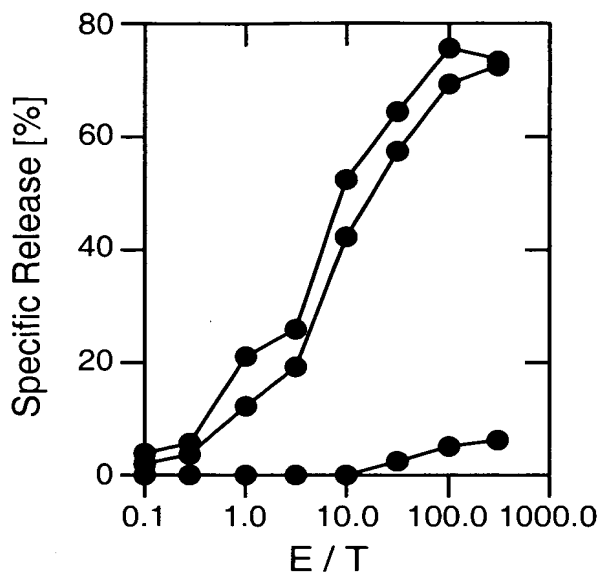
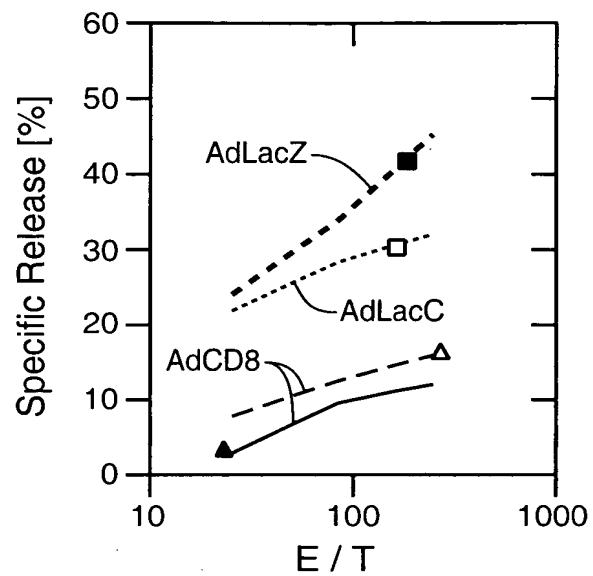
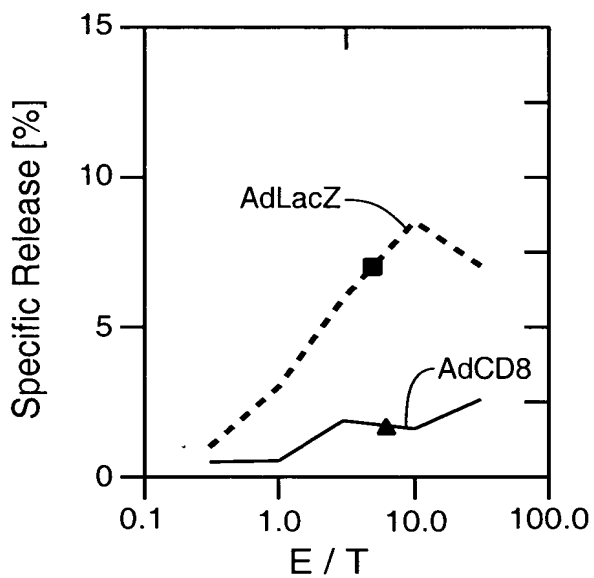
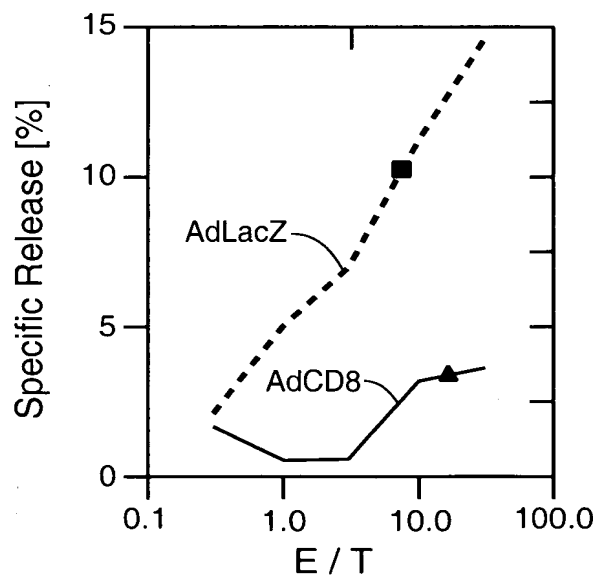
**FIG. 10A****FIG. 10B**

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**FIG. 10C****FIG. 10D**



**FIG. 11A****FIG. 11B****FIG. 11C****FIG. 11D****FIG. 11E**

**FIG. 12****FIG. 13****FIG. 14A****FIG. 14B**

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Hemoglobin  $\beta$ mRNA

1 acatttgct ctgacacaac tgtgttcaact agcaacctca aacagacacc atggtgcatc  
61 tgactcctga ggagaagtct gccgttactg ccctgtgggg caaggtgaac gtggatgaag  
121 ttggtgggga ggccctgggc aggcctgctg tggctaccc ttggaccag aggttcttg  
181 agtccttgg ggaatctgcc actcctgatg ctgttatggg caaccctaag gtgaaggctc  
241 atggcaagaa agtgctcggg gctttagtg atggcctggc tcacctggac aacctcaagg  
301 gcaccttgc cacactgagt gagctgcact gtgacaagct gcaogtggat cctgagaact  
361 tcaggctcct gggcaacgtg ctggtctgtg tgcggccca tcacttggc aaagaattca  
421 cccaccagt gcaggctgcc taccagaaag tggggctgg tgggctaata gccctggccc  
481 acaagtatca ctacgtcgc ttcttgctg tccaatttct attaaagggt ccttgttcc  
541 ctaagtccaa ctactaaact gggggatatt atgaagggcc ttgagcatct ggattctgcc  
601 taataaaaaa cattatttt cattgc

**FIG.\_15**

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## GATA-binding protein

mRNA

1 gcaaaggcca aggccagcca ggacaccccc tgggatacaca ctgagcttgc cacatcccca  
 61 aggcggccga accctccgca accaccagcc caggttaatc occagaggct ccatggagtt  
 121 cctggcctg gggctccctg ggacctcaga gccctcccc cagtttgttg atctgcct  
 181 ggtgtctcc acaccagaat caggggtttt ctccctct gggctgagg gcttgatgc  
 241 agcagcttc tccactgcc cgagcacagc caccgtgca gctgoggcac tggcclacta  
 301 cagggagcgt gaggctaca gacactcccc agctttcag gtgtacccat tgcatactg  
 361 tatggagggg atcccagggg gctcaccata tgcggctgg gctaaggca agacggggct  
 421 ctacctgcc tcaactgtgt gtccacccg cgaggactt cctcccagg ccgtggaaga  
 481 tctgatgga aaaggcagca ccagctctt ggagacttg aagacagagc ggcagagcc  
 541 agacctctg accctgggac ctgcadgcc ttcatcact cctgtccca atagtctta  
 601 tggggggcct gactttcca gtacctt tctccacc gggagcccc tcaatcagc  
 661 agcctatcc tctccaagc ttgtggaac tctccctg cctccctg aggcaggga  
 721 gtgtgtgaa tgcggagcaa cagccactcc actgtggcg agggacagga caggccacta  
 781 cctatgcaac gctgcggcc tctatcaca gatgaatggg cagaacaggc cctcatccg  
 841 gcccaagaag cgcctgattg tcagtaaagc ggcaggta ct cagtgcacca actgccagac  
 901 gaccaccaag acactgtggc ggagaaatgc cagtgggat ccgtgtgca atgcctcgg  
 961 cctctactac aagctacacc aggtgaaccg gccadgacc atgcggaagg atggtattca  
 1021 gactcgaac cgcaaggcat ctggaaaagg gaaaaagaaa cggggctcca gctgggagg  
 1081 cacaggagca gccgaaggac cagctggtg cttatggtg gtggctggg gcagcggtg  
 1141 cgggaattgt ggggaggtg ctcaggcct gacactggc ccccaggta ctgccatct  
 1201 ctaccaaggc ctgggccctg ttgtctgtc agggcctgt agccacctca tgccttccc  
 1261 tggaccccta ctgggtcac ccaogggct ctcccccaca ggcccatgc ccccaaccac  
 1321 cagcactact gtgtggctc cgtcagctc atgaggcac agagcatggc ctccagagga  
 1381 ggggtggtgt cctctctc ttgtagccag aattctggac aaccaagtc tctgggccc  
 1441 aggcaccccc tggctgaac ctcaaagct ttgtaaaat aaaaccacca aagtcctgaa  
 1501 aaaaaaaaaa aaaaaaaaaa aa

**FIG. 16**

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**d-aminoevulinate synthase**mRNA

1 cacctgcat tcgtcgtcc tcagtgcagg gcaacaggac ttaggttca agatggtgac  
 61 tgcagccatg ctgctacagt gctgcccagt gcttgcccgg ggccccacaa gcctcctagg  
 121 caaggtggtt aagactcacc agttcctgtt tggattgga cgctgtccca tctggctac  
 181 ccaaggacca aactgttctc aaatcacct taaggcaaca aaggctggag gagattctcc  
 241 atcttgggcg aagggccact gtcccttcat gctgtcggaa ctccaggatg ggaagagcaa  
 301 gattgtgcag aaggcagccc cagaagtcca ggaagatgtg aaggcttca agacagatct  
 361 gcctagctcc ctggtctcag tcagcctaag gaagccattt tccggtcccc aggagcagga  
 421 gcagatctct gggaaggta cacacctgat tcagaacaat atgcctggaa actatgtct  
 481 cagttatgac cagttttca gggacaagat catggagaag aaacaggatc acacctaccg  
 541 tgtgtcaag actgtgaacc gctgggctga tgcatatccc ttgcccac atttcttga  
 601 ggcattctgt gcctcaaagg atgtgtccgt ctggtgtagt aatgattacc tgggcatgag  
 661 ccgacacct caggtcttc aagccacaca ggagacctg cagcgtcatg gtgctggagc  
 721 tggtggcacc cgcaacatct caggcaccag taagtttcat gtggagcttg agcaggagct  
 781 ggctgagctg caccagaagg actcagccct gctcttctcc tctgctttg ttgccaatga  
 841 ctctactctc ttaccttgg ccaagatct gccagggtgc gagatttact cagacgcagg  
 901 caaccatgct tccatgatcc aaggtatccg taacagtga gcagccaagt ttgtcttcag  
 961 gcacaatgac cctgaccacc taaagaaact tctagagaag tctaacccta agatacccaa  
 1021 aattgtggcc ttgagactg tccactccat ggatggtgcc atctgtccc togaggagtt  
 1081 gtgtgatgtg tcccaccagt atggggccct gacctcgtg gatgaggctc atgctgtagg  
 1141 actgtatggg tccggggcg ctgggattgg ggagcgtgat ggaattatgc ataagattga  
 1201 catcatctct ggaactctg gcaaggcctt tggctgtgtg ggcggctaca ttgccagcac  
 1261 ccgtgacttg ttggacatgg tgcgtccta tctgcaggc tcatcttta ccacttctct  
 1321 gcccccatg gtgctctctg gagctctaga atctgtcgg ctgctcaagg gagaggaggg  
 1381 ccaagccctg aggcgagccc accagcgcaa tgtcaagcac atgcgccagc tactcatgga

**FIG. 17A**

1441 caggggcctt cctgtcatcc cctgccccag ccacatcatc cccatccggg tgggcaatgc  
1501 agcactcaac agcaagctct gtgatctcct gctctccaag catggcatct atgtgcaggc  
1561 catcaactac ccaactgtcc ccoggggtga agagctcctg cgcttggcac cctccccca  
1621 ccacagccct cagatgatgg aagattttgt ggagaagctg ctgctggctt ggactgcggt  
1681 ggggctgccc ctccaggatg tgtctgtggc tgctgcaat ttctgtgcc gtcctglaca  
1741 ctttgagctc atgagtgagt gggaacgttc ctactcggg aacatggggc cccagtatgt  
1801 caccacctat gctgagaag ccagctgcct aggattcaca cccacctgc gcttacttg  
1861 ggtccaggcc tactcctgtc ttctgcttgg ttgtgtgcct ctagtgaat tgagcctaaa  
1921 aataaagcac aaaccac

**FIG.\_17B**

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**Glucose-6-phosphate-dehydrogenase**mRNA

1 agggacagcc cagaggaggc gtggccacgc tgccggcgga agtggagccc tccgcgagcg  
 61 cgcgaggccg ccggggcagg cggggaaacc ggacagtagg ggcggggccc ggccggcgat  
 121 ggggatgcgg gagcactacg cggagctgca cccgtgcccg ccggaattgg ggatgcagag  
 181 cagcggcagc gggatggca ggcagccggc gggccggcct ccagcgcagg tgcccgagag  
 241 gcaggggctg gcttgggatg cgcgcgcacc tgccctcgcc ccgccccgcc cgcacgaggg  
 301 gtgttgccg agggcccgcc ccgcacgcct cgctgaggc ggtccgctc agcccaggcg  
 361 cccgcccccg ccccgccga ttaaatgggc cggcggggct cagcccccg aaacggtcgt  
 421 aacttcgggg ctgcgagcgc ggagggcgac gacgacgaag cgcagacagc gtcattggcag  
 481 agcaggtggc cctgagccgg acccaggtgt gcgggatcct gcgggaagag ctttccagg  
 541 gcgatgcctt ccatcagtcg gatacacaca tattcatcat catgggtgca tgggtgacc  
 601 tggccaagaa gaagatctac ccacccatct ggtggctgtt ccgggatggc ctctgcccg  
 661 aaaacacctt catcgtggc tatgccgtt cccgcctcac agtggctgac atccgaaac  
 721 agagtggcc ctcttcaag gccacccag aggagaagct caagctggag gacttcttg  
 781 ccgcaactc ctatgtggct ggccagtcg atgatgcagc ctctaccag cgctcaaca  
 841 gccacatgga tgccctccac ctggggtcac aggccaaccg cctctctac ctggcctgc  
 901 cccgaccgt ctacgaggcc gtcaccaaga acattcaaga gtctgcatg agccagatag  
 961 gctggaaccg catcatcgtg gagaagccct tcgggaggga cctgcagagc tctgaccggc  
 1021 tgtccaacca catctctcc ctgtccgtg aggaccagat ctaccgcac gaccactacc  
 1081 tgggcaagga gatgggtcag aacctatgg tgctgagatt tgccaacagg atctcggcc  
 1141 ccatctggaa ccgggacaac atgcctgcg ttatctcac ctcaaggag cccttggca  
 1201 ctgagggtcg cgggggctat ttgatgaat ttggatcat ccgggacgtg atgcagaacc  
 1261 acctactgca gatctgtgt ctggtggcca tggagaagcc cgctccacc aactcagatg  
 1321 acgtccgtga tgagaaggc aaggtgtga aatgcatctc agaggtgcag gccaacaatg  
 1381 tggctctggg ccagtcgtg gggaaccccg atggagaggg cgaggccacc aaaggtacc

**FIG. 18A**

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1441 tggacgaccc caggtgccc cgggggtcca ccaccgccac tttgcagcc gtcgtcctt  
 1501 atgtggagaa tgagaggtgg gatgggggtgc ccttcacctt gcgctgcggc aaggccctga  
 1561 acgagcgcaa ggccgaggtg aggtgcagt tccatgatgt ggccggcgac alctccacc  
 1621 agcagtgcaa gcgcaacgag ctggtgalcc gcgtgcagcc caacgaggcc gtgtacacca  
 1681 agatgatgac caagaagccg ggcatgtct tcaaccccga ggagtcggag ctggacctga  
 1741 cctacggcaa cagatacaag aacgtgaagc tccctgacgc ctacgagcgc ctcaccttg  
 1801 acgtctctg cgggagccag atgcacttg tgcgcagcga cgagctccgt gaggcctggc  
 1861 gtattttcac cccactgctg caccagattg agctggagaa gcccagccc atcccctata  
 1921 ttatggcag ccgaggcccc acggaggcag acgagctgat gaagagagt ggtttccagt  
 1981 atgagggcac ctacaagtgg gtgaaccccc acaagctctg agccctgggc acccacctc  
 2041 acccccgcca cggccacct cctcccgcc gcccgacccc gagtcgggag gactccggga  
 2101 ccattgaact cagctgcaca ttctggccc cgggctctg ccacctggc cggcccttg  
 2161 ctgctgtac tacccgagcc cagctacatt cctcagctgc caagcactg agaaccatc  
 2221 ggcccdcca gacctgct gagccagga gctgagtcac ctctccact cactccagcc  
 2281 caacagaagg aaggaggagg gcgccattc gtctgtcca gagctattg gccactgggt  
 2341 ctactctg agtggggcca ggtgggagg gagggacaag ggggaggaaa gggcgagca  
 2401 cccagtgag agaactgcc tgtggcctg ccgcccagcc tcagtccac ttgacattc  
 2461 ttgtaccag caacatctg agcccccctg atgccccg tccaccaac tctgcactc  
 2521 atggccccc cgtgccccc gtaggcagcc tctgtctat aagaaaagca gacgcagcag  
 2581 ctgggacccc tcccaacctc aatgcctgc cattaaatcc gcaaacagcc aaaaaaaaaa  
 2641 aaaaaaaaaa

**FIG. 18B**



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## Ornithine carbamoyl transferase

mRNA

1 gagccccagg actgagatat ttctactata ccttctctat catcttgac ccccaaaata  
 61 gctccaggg cacttctatt tgttttg gaaagactgg caattagagg tagaaaagt  
 121 aaataaatgg aaatagtact actcagggt gtcacatcta catctgtgtt ttgcagtg  
 181 caattgcat ttctgagtg agttacttct actcacctc acagcagcca gtaccgcagt  
 241 gcctgcata tattatatcc tcaalgagta ctgtcaatt gattttgtac atgcgtgtga  
 301 cagtataaat atattatgaa aaatgaggag gccaggcaat aaaagagtca ggatttctc  
 361 caaaaaaat acacagcggg ggagcttggc ataaagtca aatgctcta caccctgccc  
 421 tgcagtatct ctaaccaggg gacttgata aggaagctga aggtgatat taccttgc  
 481 cctcactgc aactgaacac atttctagt tttaggtgg ccccgctgg ctaactgct  
 541 gtggagttt caagggcata gaatcgtct ttacacaatt aaaagaagat gctgttaat  
 601 ctgaggatcc tgttaaaca tgcagcttt agaatggc acaactcat ggttcgaaat  
 661 ttccgtgtg gacaaccact acaaaataaa gtgcagctga agggccgtga ccttctact  
 721 ctaaaaaact ttaccggaga agaaataaa tatatgctat ggctatcagc agatctgaa  
 781 tttaggataa aacagaaagg agagtattg ccttattgc aagggaagtc cttaggcag  
 841 attttgaga aaagaagtac tgaacaaga ttgtacag aaacaggctt tgcactctg  
 901 ggaggacatc ctgtttct taccacaca gatactatt tgggtgtgaa tgaagctc  
 961 acggacacgg ccgtgtatt gtctagcatg gcagatgcag tattggctcg agtgataaa  
 1021 caatcagatt tggacacct tgctaaagaa gcatccatcc caattatcaa tgggctgtca  
 1081 gattgtacc atctatcca gatcctggc gattacctca cgtccagga aactatagc  
 1141 tcttgaaag gtctacct cagctggatc ggggatggga acaatctct gactccatc  
 1201 atgatgagcg cagcgaaatt cggaatgcac ctccaggcag ctactcaaa gggttatgag  
 1261 ccgatgcta gtgaaccaa gttggcagag cagtatgcca aagagaatgg taccaagctg  
 1321 ttgctgaca atgatccatt ggaagcagc catggaggca atgtattaat tacagacact  
 1381 tggataagca tgggacaaga agaggagaag aaaaagcggc tccaggctt ccaagggtac

**FIG. 19A**

1441 cagggtacaa tgaagactgc taaagttgct gcctctgact ggacatfff acactgcttg  
1501 cccagaaagc cagaagaagt ggalgatgaa gcttttatt ctctcgatc actagtgttc  
1561 ccagaggcag aaaacagaaa gtggacaatc atggctgtca tgggtccct gctgacagat  
1621 tactcacctc agctccagaa gcctaaattt tgatgtgtg ttacttgtca agaaagaagc  
1681 aatgttcttc agtaacagaa tgagttggtt tatggggaaa agagaagaga atctaaaaaa  
1741 taaacaaatc cctaacacgt ggtatgggtg aaccgtatga tatgctttgc cattgtgaaa  
1801 ctttccttaa gccttlaatt taagtgtga tgcactgtaa tacgtgctta actttgctta  
1861 aactctctaa ttcccaattt ctgagttaca ttagatatc atattaatta tcatatacat  
1921 ttacttc

**FIG.\_19B**

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 $\alpha$ -L-iduronidasemRNA

1 gtcacatggg gtgcgcgccc agactccgac ccggaggcgg aaccggcagt gcagcccga  
 61 gccccgcagt ccccgagcac gcgtggccat gcgtccctg cgcgcccgcg ccgcgctgct  
 121 ggcgctcctg gcctcgctcc tggccgcgcc ccgggtggcc ccggccgagg ccccgcacct  
 181 ggtgcaggtg gacgcggccc gcgcgctgtg gccctgcgg cgcttctgga ggagcacagg  
 241 ctctgcccc ccgtgccac acagccaggc tgaccagtac gtcctcagct gggaccagca  
 301 gctcaaccic gcctatgtgg gcgccgtccc tcaccgcggc atcaagcagg tccggaccca  
 361 ctggctgctg gagcttgtca ccaccagggg gtccactgga cggggcctga gctacaact  
 421 caaccacctg gacgggtact tggaccttct cagggagaac cagctcctcc cagggttga  
 481 gctgatgggc agcgccctgg gccacttcac tgactttgag gacaagcagc aggtgttga  
 541 gtggaaggac ttggtctoca gctggccag gagatacatc ggtaggtacg gactggcgca  
 601 tgtttccaag tgaacttcg agacgtggaa tgagccagac caccacgact ttgacaacgt  
 661 ctcatgacc atgcaaggct tctgaacta ctacgatcc tgcgcggagg gtctgcgcgc  
 721 cgcagcccc gccctgcggc tgggaggccc cggcgactcc ttccacccc caccgcgatc  
 781 cccgtgagc tggggcctcc tgcgccactg ccacgacggf accaacttct tcactgggga  
 841 ggcgggcgct cggtggact acatctccct ccacaggaag ggtgcgcgca gctccatctc  
 901 catctggag caggagaagg tcgtgcgca gcagatccgg cagctctcc ccaagttgc  
 961 ggacaccccc attacaacg acgaggcgga ccgcctggtg ggctggctcc tgccacagcc  
 1021 gtggagggcg gacgtgacct acgcggccat ggtgtgaag gtcacgcgc agcatcagaa  
 1081 cctgctactg gccaacacca cctcgcctt cccctacgg ctctgagca acgacaatgc  
 1141 ctctdgagc taccacccgc accccttgc gcagcgcacg ctacccgcg gcttcaggf  
 1201 caacaacacc cgcgcgcgc acgtgcagct gttgcgcaag ccggtgtca cggccatggg  
 1261 gctgtggcg ctgctggaag aggagcagct ctgggccgaa gtgtgcagg ccgggaccgt  
 1321 cctggacagc aaccacacgg tgggcgtcct ggccagcgcc caccgcccc agggcccggc  
 1381 cgacgcctgg cgcgcgcgg tgctgatcta cgcagcgcgac gacacccgcg cccaccccaa

**FIG. 20A**

1441 ccgcagcgtc gcggtgaccc tgcggctgcg cgggglgccc cccggcccgg gcctggctca  
1501 cgtcacgcgc tacctggaca acgggctctg cagccccgac ggcgagtggc ggcgcdtggg  
1561 ccggcccgtc ttccccacgg cagagcagtt ccggcgcatg cgcgcggctg aggacccggt  
1621 ggccgcggcg ccccgccctt tacccgcggc cggccgctg acctgcgcc ccgcgtgcg  
1681 gctgccgtcg ctttgcctg tgacgtgtg tgcgcgccc gagaagccgc ccgggcaggt  
1741 cgcgcggctc cgcgccctgc cctgaccca agggcagctg gttctggtct ggtcggatga  
1801 acacgtgggc tccaagtgcc tgtggacata cgagatccag ttctctcagg acggtlaaggc  
1861 gtacaccccg gtcagcagga agccatcgac cttaacctc ttgtgttca gccagacac  
1921 aggtgctgtc tctggctcct acgagttcg agccctggac tactgggccc gaccaggccc  
1981 ctctcggac cctgtccgt acctggaggt cctgtgcca agagggcccc catccccggg  
2041 caatccatga gctgtgtctg agccccagtg ggttgacct ccacggcag tcagcgagct  
2101 ggggctgcac tgtgccatg ctgccctcc atcacccct ttgcaatata ttttatatt  
2161 ttattattt ctttatac ttgtaaaaa aaaaaaa

**FIG.\_20B**

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 $\beta$ -glucosidasemRNA

1 gctaacctag tgccatagc taaggcaggc acctgcatcc ttgttttgt ttagtggatc  
 61 ctctatcctt cagagactct ggaacccctg tggctcttc tcatctaata gaccctgagg  
 121 ggatggagtt ttcaagtcct tcagagaggg aatgtcccaa gcctttgagt agggtaagca  
 181 tcatggctgg cagcctcaca ggtttgcttc tacttcaggc agtgtcgtgg gcatcagggt  
 241 cccgccccctg catccctaaa agcttcggct acagctcggg ggtgtgtgtc tgcaatgcc  
 301 catactgtga ctctttgac cccccgacct ttctgccct tggtaacctc agccgctatg  
 361 agagtacacg cagtggggcg cggaaggagc tgagtatggg gccatccag gtaatacaca  
 421 cgggcacagg cctgctactg acctgcagc cagaacagaa gtccagaaa gtgaagggat  
 481 ttgagggggc catgacagat gctgctgtc tcaacatctt tgcctgtca cccctgccc  
 541 aaaatttgc acttaaatcg tacttctctg aagaaggaat cggatataac atcatccggg  
 601 taccatggc cagctgtgac ttctccatcc gacctacac ctatgcagac accctgatg  
 661 atttcagtt gcacaattc agcctccag aggaagatac caagctcaag ataccctga  
 721 ttacogagc cctgcagttg gccagcgtc ccgtttact cctgccagc cctgggacat  
 781 caccacttg gctcaagacc aatggagcgg tgaatggaa ggggtcactc aaggagacgc  
 841 ccggagacat ctaccaccag acctgggcca gatacttgt gaagttcctg gatgctatg  
 901 ctgagcaca gttacagttc tgggcagtga cagctgaaa tgagccttct gctgggctgt  
 961 tgagtggata ccccttcag tgcttgggt tcacctga acatcagcga gacttcattg  
 1021 cccgtgacct aggtcctacc ctgccaaca gtactacca caatgtccg ctactcatg  
 1081 tggatgacca acgcttgctg ctgccccact gggcaaagg ggtactgaca gaccagaag  
 1141 cagctaaata tgtcatggc attgctgtac attggtacct ggactttctg gctccagcca  
 1201 aagccacct aggggagaca cccgcctgt tcccaacac catgctctt gctcagagg  
 1261 cctgtgtggg ctcaagttc tgggagcaga gtgtcgggt aggtcctgg gatcgagga  
 1321 tgcatgacg ccacagcatc atcacgaacc tctgtacca tgtgtcggc tggaccgact  
 1381 ggaacctgc cctgaacccc gaaggaggac ccaattgggt gcgtacttt gtcgacagtc

**FIG.\_21A**

1441 ccatcattgt agacatcacc aaggacacgt ttacaaaca gcccatgttc taccaccttg  
1501 gccacttcag caagttcatt cctgagggct ccagagaggt ggggctgggt gccagtcaga  
1561 agaacgaact ggacgcagtg gcactgatgc atcccgatgg ctctgctgtt gtggtcgtgc  
1621 taaaccgctc ctctaaggat gtgcctctta ccatcaagga tcctgctgtg ggcttcctgg  
1681 agacaatctc acctggctac tcattcaca cctacctgtg gcatcgccag tgatggagca  
1741 gatactcaag gaggcactgg gctcagcctg ggcattaaag ggacagagtc agctcacacg  
1801 ctgtctgtga ctaaagaggg cacagcaggg ccagttgtgag ctacagcga cgtaagccca  
1861 ggggcaatgg ttgggtgac tcacttccc ctctaggtgg tgcccagggc tggaggcccc  
1921 tagaaaaaga tcagtaagcc ccagtgtccc ccagccccc atgcttatgt gaacatgcgc  
1981 tgtgtgctgc ttgcttggga aactngcctg ggiccaggcc tagggtgagc tcactgtccg  
2041 taaaacaca agatcagggc tgagggtgaa gaaaagaaga gactaggaaa gctgggcccc  
2101 aaactggaga ctgttctct ttctagaga tgcagaactg ggcccgtgga gcagcagttg  
2161 cagcatcagg gcggaagcct taaagcagca gcgggtgtgc ccaggcaccg agatgattcc  
2221 tatggcacca gccaggaaaa atggcagctc ttaaaggaga aaatgtttga gccc

**FIG.\_21B**

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 $\alpha$ -galactosidasemRNA

1 aggttaatct taaaagccca ggttaccgc ggaaattat gctgtccgt caccgtgaca  
 61 atgcagctga ggaaccaga actacatcg ggctgcgcg ttgcgctcg ctccdgcc  
 121 ctcgttcct gggacatccc tggggctaga gcactggaca atggattggc aaggacgcct  
 181 accatgggct ggctgcactg ggagcgcttc atgtgcaacc ttgactgcca ggaagagcca  
 241 gattcctgca tcagtgagaa gctcttcag gagatggcag agctcatggt ctgagaaggc  
 301 tgaaggatg caggttatga gtacctcgc attgatgact gttgatggc tcccaaaga  
 361 gattcagaag gcagactca ggcagacct cagcgcttc ccatgggat tgcagcta  
 421 gctaattatg ttacagcaa aggactgaag ctagggattt atgcagatgt tggaaataaa  
 481 acctgcgcag gctccctgg gagtttggg tactacgaca ttgatgcca gaccttgc  
 541 gactggggag tagatctgct aaaattgat ggtgttact gtgacagtt ggaaaattg  
 601 gcagatggtt ataagcacat gtcttggcc ctgaatagga ctggcagaag cattgtgac  
 661 tctgtgagt ggcctctta tatgtggcc ttcaaaagc ccaattatac agaaatcca  
 721 cagtactgca atcactggcg aaatttgcg gacattgatg attcctggaa aagtataag  
 781 agtatctgg actggacatc tttaaccag gagagaattg ttgatgtgc tggaccagg  
 841 ggttgaatg accagatat gttagtatt ggcaacttg gcctcagctg gaatcagcaa  
 901 gtaactcaga tggccctcg ggctatcatg gctgctcct tattcatgct taatgacct  
 961 cgacacatca gccctcaagc caaagctct ctcaggata aggacgta tgcctcaat  
 1021 caggacccct tgggcaagca aggttaccag ctagacagg gagacaact tgaagtgtg  
 1081 gaacgacctc ttcaggctt agcctgggct gtagctatga taaaccggca ggagattgt  
 1141 ggacctcgt ctataccat cgcagttgct tccctgggta aaggagtggc ctgtaacct  
 1201 gcctgcttca tcacacagct cctccctgag aaaaggaagc tagggttcta tgaatggact  
 1261 tcaagggtta gaagtcacat aaatcccaca ggcactgtt tgcttcagct agaaaatata  
 1321 atgcagatgt cattaaaaga ctactttaa

**FIG.\_22**